

The background image shows a close-up of a water sampling device, possibly a pump or a probe, submerged in a river. The device is dark and cylindrical, with a white, funnel-like component at the end. Water is splashing around the device, indicating it is in use. The text is overlaid on this image.

TRAINING AND EQUIPMENT FOR SAMPLE COLLECTION ON LARGE RIVERS DURING HIGH FLOW

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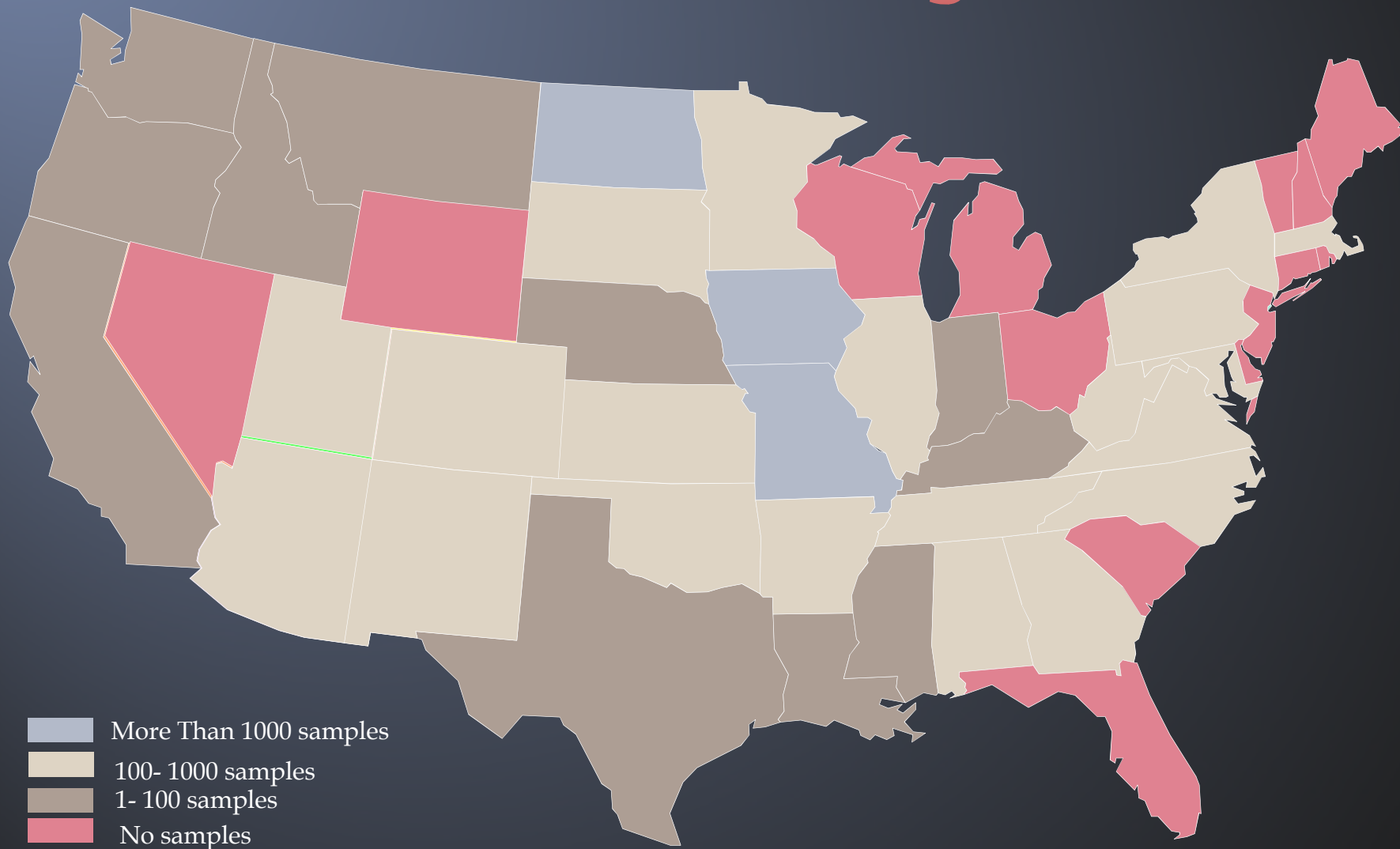
Mark Landers

USGS Office of Surface Water



9th National Monitoring Conference
April 28 - May 2, 2014
Cincinnati, Ohio

Number of Samples Collected with D-96 and D-99 through 2011

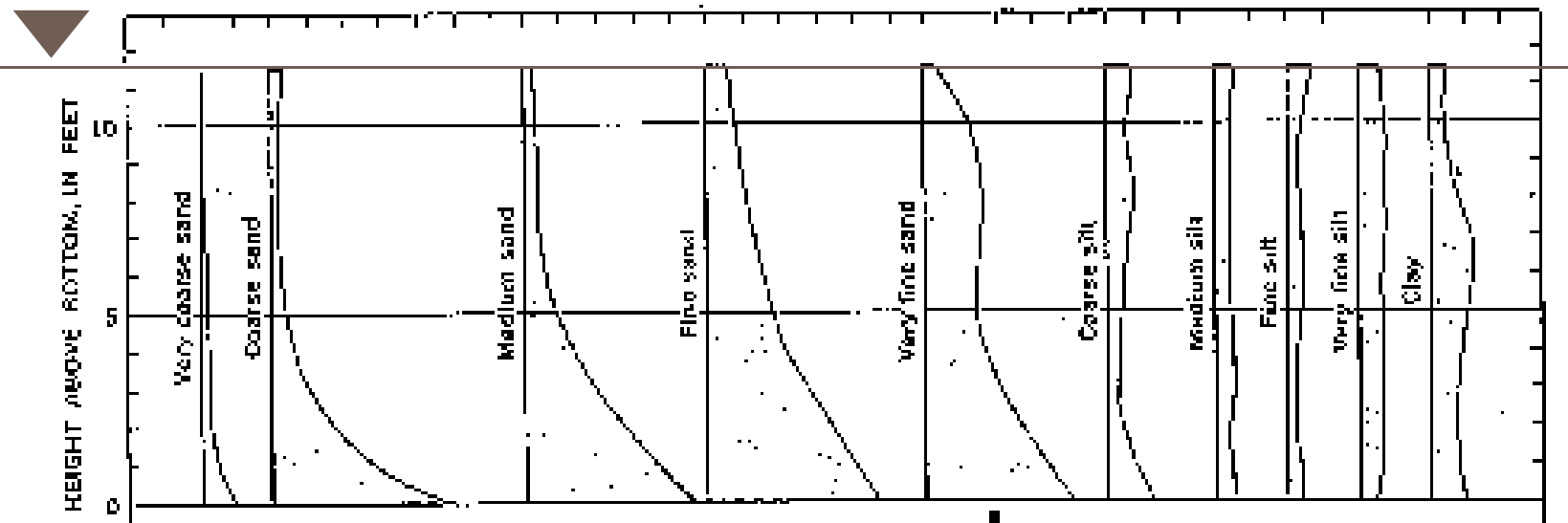


Alaska not shown

D-99 and D-96 samplers are required to collect representative samples in fast deep rivers

SEDIMENT CONCENTRATION VS DEPTH

COARSER ← SAND → FINER SILT → CLAY



TOP

400

500

BOTTOM

2,000

500

Representative Samples?

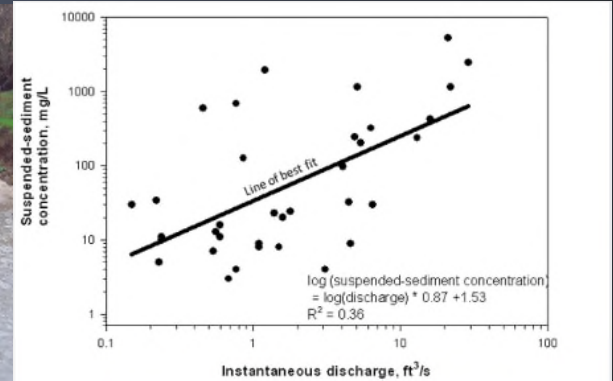
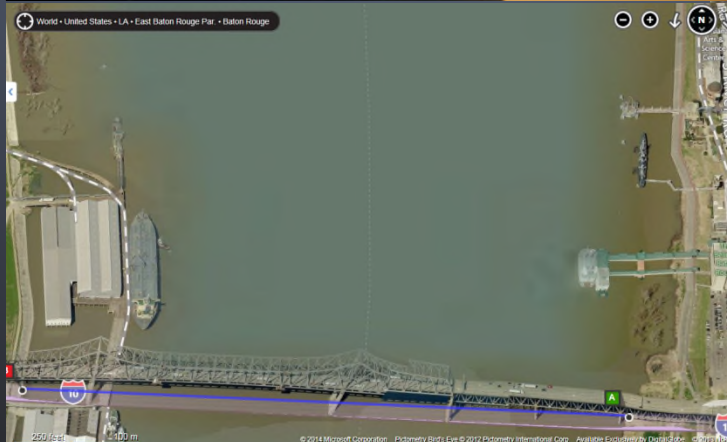


Figure 2. Suspended-sediment transport curve for Poland Run near Swanton, Maryland, for samples collected from October 1, 2007, through September 30, 2008. [ft^3/s , cubic feet per second; mg/L , milligrams per liter]

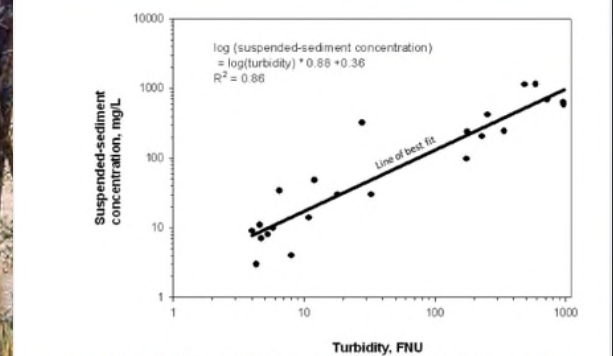


Figure 3. Turbidity plotted against suspended-sediment concentrations for Poland Run near Swanton, Maryland, for samples collected from October 1, 2007 through September 30, 2008. [FNU, Formazin Nephelometric Units; mg/L , milligrams per liter]

Samplers for Large Rivers

Sampler	D-96	D-99
Maximum Depth (ft)	110	220
Maximum Velocity (ft/s)	12.5	15
Weight (lbs)	132	275
Sample Volume (L)	3	6



USGS Water Mission Area
Retrospective Analysis
Concluded Additional samplers
should be obtained and located
in areas most likely needed

D-99 Bag-Samplers

3 Additional D-99 samplers were assembled but pre-positioning was delayed until it was determined what Water Science Centers had the personnel and support equipment to use the samplers.

POSITIONED:

- ▣ Louisiana
- ▣ Mississippi
- ▣ Washington
- ▣ (Arkansas)

REQUIREMENTS FOR DEPLOYMENT AND OPERATIONS

- ▣ Training
 - Sampling and controlling the platform (boat)
- ▣ Infrastructure
 - Boats
 - Power
 - Booms and reels

Office of Surface Water and Office of Water Quality supported the first training for safe sample collection on large rivers

Sampling on large rivers requires a significant investment -- boats, specialized sampling gear and most importantly people.



Infrastructure and Training

This training is a continued commitment to safe data collection on large rivers during extreme events. First opportunity to observe and inspect equipment of their counterparts in other centers.

- ▣ Boats
- ▣ Navigation
- ▣ Support Equipment
- ▣ Emergency Procedures



Safety

Some safety considerations are similar to data collection efforts on bridges
but others are very specific to the river

- ▣ Motor Vehicles
- ▣ Vessels
- ▣ Weather
- ▣ River traffic
- ▣ Cables and reels
- ▣ Submerged or floating debris
- ▣ Emergency Procedures

- ▣ Everyone is a safety Officer

Safe boat operations include float plan, trailering, launch and recovery, load distribution, recognize/avoid hazards, visibility – see and be seen (avoid being a hazard).

FLOAT PLAN

INSTRUCTIONS: Complete this plan before you go boating and leave it with a reliable person who can be depended upon to notify the Coast Guard, or other rescue organization, should you not return or check-in as planned. If you have a change of plans after leaving, be sure to notify the person holding your float plan. For additional copies of this plan, visit: www.floatplancentral.org

Do NOT file this plan with the U.S. Coast Guard

VESSEL

IDENTIFICATION:
Name & Hailing Port _____
Document / Registration No. _____ HIN _____
Year & Make _____
Length _____ Type _____ Draft _____ Hull Mark _____
Color _____
Permanent Features _____

PROPULSION:
Primary—Type _____
Auxiliary—Type _____
No. Eng. _____ Fuel Capacity _____
No. Eng. _____ Fuel Capacity _____

COMMUNICATION:
Radio Call Sign _____
DSC MMSI No. _____
Radio-1: Type _____ Ch / Freq Monitored _____
Radio-2: Type _____ Ch / Freq Monitored _____
Cell / Satellite No. _____
E-mail _____

NAVIGATION: (Check all on board)
☐ Maps ☐ Charts ☐ Compass ☐ GPS / DGPS
☐ Radar ☐ Sounder ☐ _____

SAFETY & SURVIVAL

VISUAL DISTRESS SIGNALS:
☐ Electric S-O-S Light
☐ Orange Flag
☐ Orange Smoke
☐ Red Flares

AUDIBLE DISTRESS SIGNALS:
☐ Bell
☐ Horn / Siren
☐ Whistle

OTHER GEAR:
☐ Drogue / Sea Anchor
☐ EPIRB
☐ Fire Extinguisher
☐ Flashlight / Searchlight
☐ Frost & Water for _____ days
☐ Foul Weather Gear

Life raft / Dinghy
☐ Personal Locator Beacon
☐ Signal Mirror

FTDx: (do not exceed type IV devices)
Quantity On Board _____

GROUND TACKLE:
☐ Anchor: Line Length _____

PERSONS ONBOARD

OPERATOR:
Name _____
Address _____
City _____ State _____ Zip Code _____
Vehicle (year, make & model) _____
Trailer will be parked at _____

PAASSENGERS / CREW:
Name & Address _____
1. _____
2. _____
3. _____
4. _____
5. _____

Notes (Special medical condition, can't swim, etc.) _____
Has experience with this Vessel ☐ with Area _____
Vehicle License No. _____
Trailer License No. _____
Notes (Special medical condition, can't swim, etc.) _____

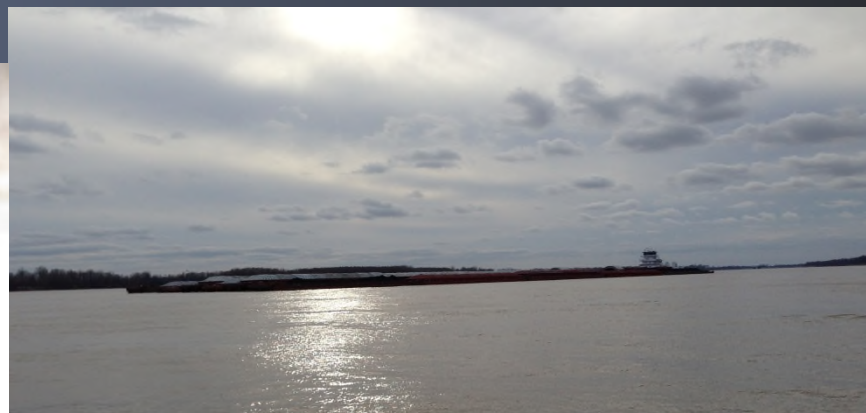
Attach "Supplemental Passenger List" if additional passengers or crew on board.



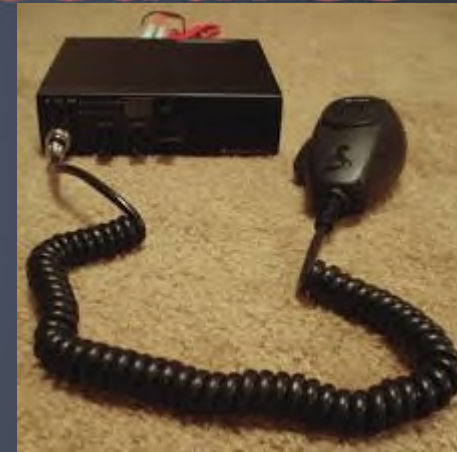
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Navigation



Emergency Procedures

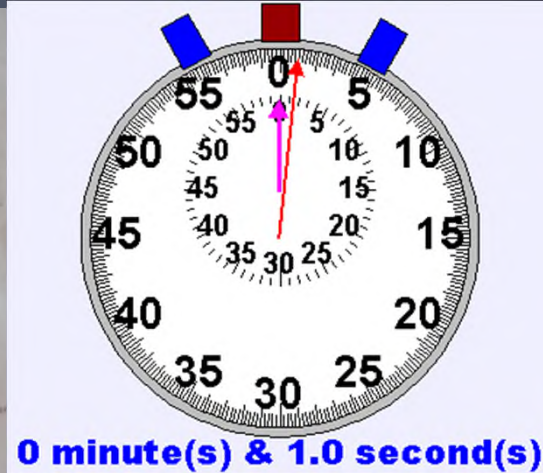
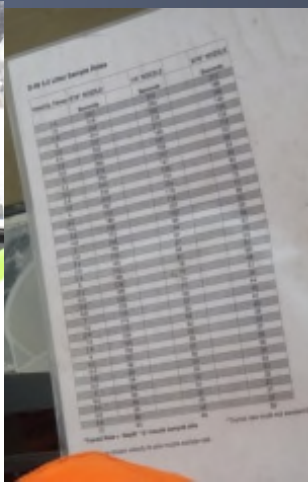


Review procedures for fire, first aid, communications, engine or equipment failure, submerged debris, cables, barges, pipelines. 911 on the water!

Support Equipment



A photograph showing a laptop and a handheld electronic device (HED) on a boat's dashboard. The laptop screen displays a software interface with multiple panels, including a large graph with a blue line and green bars, and several smaller data tables. The HED screen shows a similar interface with a large number '21' and other data points. A bright yellow life vest is visible in the foreground on the right side. The background shows a body of water and a distant shoreline with trees.



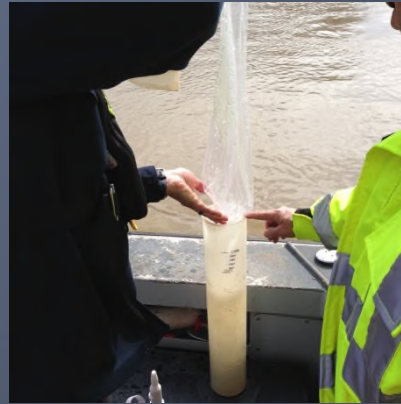
Bags need to be fully collapsed
before sample collection

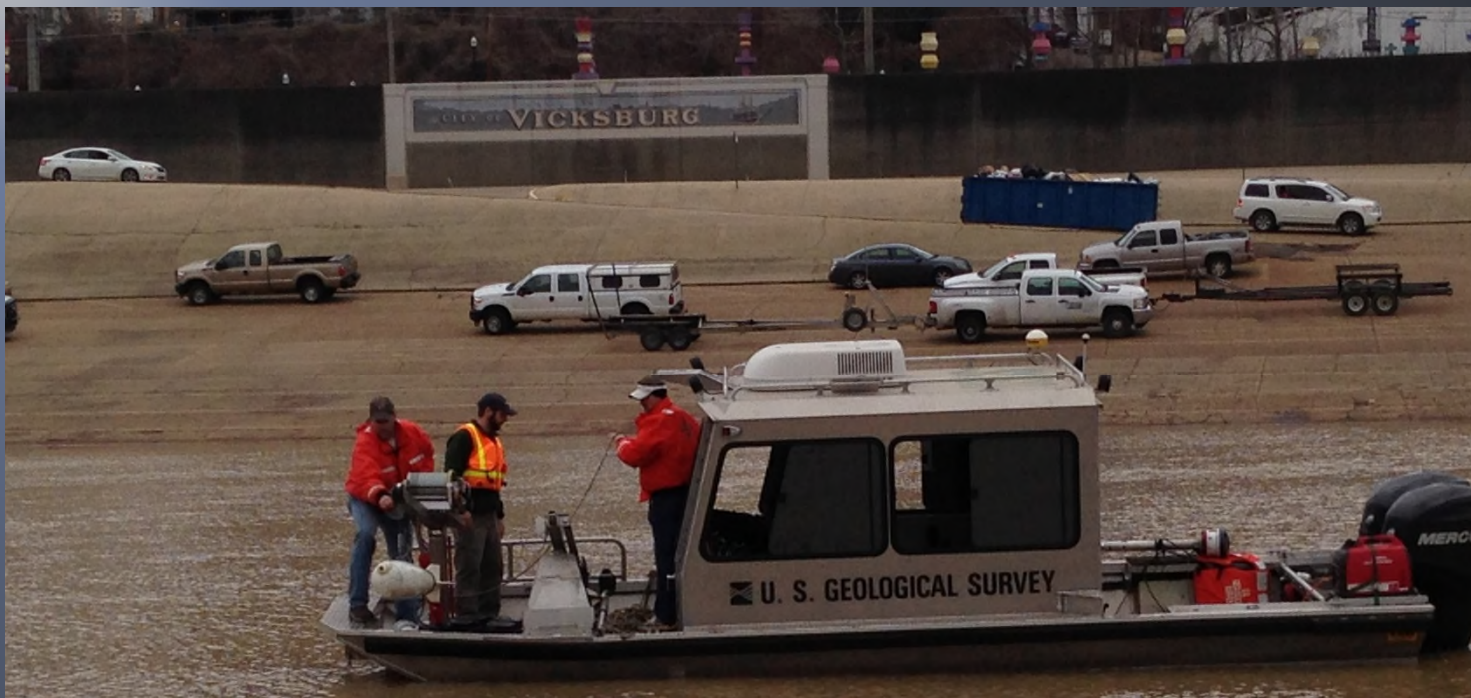


Sample



Sample transfer and volume measurement







Special Thanks

- ▣ Mark Landers (FISP)
- ▣ Dennis Evans (AR WSC)
- ▣ Mike Manning & Claire Rose (MS WSC)
- ▣ Charlie Demas (LA VFS)
- ▣ Wayne O'Neal (former FISP Chief)
- ▣ Johnny Wheat (HIF)
- ▣ Andy Hickey (GAWSC)
- ▣ Office of Surface Water
- ▣ Office of Water Quality
- ▣ Federal Interagency Sedimentation Project
- ▣ Hydrologic Instrumentation Facility